

**What is claimed is:**

1. An elevator control device having
  - a rectifier circuit that converts an AC voltage from an
  - 5 AC power source to a DC voltage;
  - a DC capacitor that smoothes ripples of said DC voltage;
  - an inverter that converts a smoothed DC voltage to an AC
  - voltage of variable voltage and variable frequency;
  - a motor that is driven by said AC voltage that is output
  - 10 from said inverter to raise or lower a passenger cage;
  - a resistance chopper that is connected in parallel with
  - said DC capacitor; and
  - a drive control unit that controls said inverter or
  - controlling said resistance chopper such that said AC
  - 15 voltage of variable voltage and variable frequency is output
  - in accordance with a speed instruction,
  - said elevator control device comprising:
    - an electric double layer capacitor having an
    - electrostatic capacitance that is substantially larger than
    - 20 that of said DC capacitor and that is connected in parallel
    - with said DC capacitor, and capable of accumulating
    - substantially all of a regenerated power from said motor;
    - and
    - a voltage detection unit that detects a terminal voltage
    - 25 of said electric double layer capacitor,

wherein said drive control unit employs a voltage in a vicinity of a rated voltage of a electric double layer capacitor as a drive voltage of a resistance chopper and operates and controls said resistance chopper when a  
5 terminal voltage detected by said voltage detection unit reaches a voltage in a vicinity of said rated voltage of said electric double layer capacitor.

2. The elevator control device according to claim 1,  
10 further comprising:

a switch connected in series with said electric double layer capacitor, that is turned on in response to an operating instruction from said drive control unit during normal operation and that isolates said electric double  
15 layer capacitor from said DC capacitor when operation is stopped.

3. The elevator control device according to claim 1, further comprising:

20 an initial charging circuit connected in series with said electric double layer capacitor and connected in parallel with said switch and a resistance, and

wherein said drive control unit charges said electric double layer capacitor while restricting a current during  
25 current passage from said AC power source by means of said resistance when said switch is turned off on commencement of

current passage from said AC power source and that connects said electric double layer capacitor in parallel with said DC capacitor when said switch is turned on after a required time after commencement of passage of current by said AC  
5 power source.

4. The elevator control device according to claim 1, further comprising:

a current breaking circuit connected in series with said  
10 electric double layer capacitor and that breaks an inflow of excess a current produced by a short-circuit fault of said DC capacitor or said inverter to said electric double layer capacitor.

15 5. The elevator control device according to claim 1, further comprising:

an initial charging circuit connected in series with said electric double layer capacitor, connected in parallel with said switch and a resistance,

20 wherein said drive control unit charges said electric double layer capacitor while restricting a current during current passage from said AC power source by means of said resistance when said switch is turned off on commencement of current passage from said AC power source and that connects  
25 said electric double layer capacitor in parallel with said DC capacitor when said switch is turned on after a required

time after commencement of passage of current by said AC power source; and

a current breaking circuit connected in series with said electric double layer capacitor and that breaks an inflow of excess a current produced by a short-circuit fault of said DC capacitor or said inverter to said electric double layer capacitor.

6. The elevator control device according to any of claim 1 to claim 5, further comprising:

an electric double layer capacitor arranged so as to be capable of being connected in parallel with said DC capacitor and having an electrostatic capacitance that is substantially larger than said DC capacitor and that is capable of accumulating substantially all of a regenerated power from said motor and which, when said inverter is below a prescribed switching frequency, substitutes for a voltage smoothing function of said DC capacitor by deletion of said DC capacitor;

a voltage detection unit that detects a terminal voltage of said electric double layer capacitor,

wherein said drive control unit controls a resistance chopper when said terminal voltage that is detected by said voltage detection unit reaches a vicinity of a rated voltage of said electric double layer capacitor, a voltage in the vicinity of said rated voltage of said electric double layer

capacitor constituting said operating voltage of said resistance chopper.

7. An elevator control device comprising:

5       a rectifier circuit that converts an AC voltage from an AC power source to a DC voltage;

          an inverter that converts a DC voltage rectified by said rectifier circuit to an AC voltage of variable voltage and variable frequency;

10       an electric double layer capacitor that smoothes said DC voltage rectified by said rectifier circuit when said inverter is below a prescribed switching frequency;

          a motor that is driven by said AC voltage that is output from said inverter to raise or lower a passenger cage;

15       a resistance chopper connected in parallel with said electric double layer capacitor;

          a drive control unit that controls said inverter or controls said resistance chopper such that said AC voltage of variable voltage and variable frequency is output in accordance with a speed instruction; and

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          a voltage detection unit that detects a terminal voltage of said electric double layer capacitor,

          wherein said drive control unit employs a voltage in a vicinity of a rated voltage of said electric double layer capacitor as a drive voltage of said resistance chopper and

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operates and controls said resistance chopper when said

terminal voltage detected by said voltage detection unit reaches a voltage in the vicinity of said rated voltage of said electric double layer capacitor.

- 5        8. An elevator control device having
- a rectifier circuit that converts an AC voltage from an AC power source to a DC voltage;
  - a DC capacitor that smoothes ripples of said DC voltage;
  - an inverter that converts a smoothed DC voltage to an AC
  - 10 voltage of variable voltage and variable frequency;
  - a motor that is driven by said AC voltage that is output from said inverter to raise or lower a passenger cage;
  - a resistance chopper that is connected in parallel with said DC capacitor; and
  - 15 a drive control unit that controls said inverter such that said AC voltage of variable voltage and variable frequency is output in accordance with a speed instruction,
  - said elevator control device comprising:
    - a charging/discharging circuit connected across DC
    - 20 output lines of said rectifier circuit;
    - an electric double layer capacitor connected on an output side of said charging/discharging circuit and that stores a DC voltage generated in said DC capacitor during charging control;
    - 25 a capacitor voltage detection unit that detects a voltage generated on said DC capacitor; and

a charging/discharging control unit, wherein a charging set voltage is set that is larger than said rectified voltage from said AC power source rectified by said rectifier circuit and lower than said resistance chopper operating voltage and a discharging set voltage is set that is lower than said rectified voltage and that performs charging control of said charging/discharging circuit such that, when a voltage generated in said DC capacitor detected by said capacitor voltage detection unit exceeds said charging set voltage, said electric double layer capacitor is charged and that performs discharging control of said charging/discharging circuit such that, when a voltage generated in said DC capacitor exceeds said discharging set voltage, said electric double layer capacitor is discharged.

9. The elevator control device according to claim 1, further comprising:

a rectified output current detection unit that detects an output current of said rectifier circuit; and

a charging/discharging control unit in which, in addition to said set charging voltage, a set discharge current is set instead of said set discharge voltage;

wherein said charging/discharging control unit controls charging of said charging/discharging circuit such that a voltage generated on said DC capacitor detected by said capacitor voltage detection unit charges said electric

double layer capacitor if said set charging voltage is exceeded and controls discharging of said charging/discharging circuit such that said electric double layer capacitor is discharged if an output current of said rectifier circuit detected by said rectified output current detection unit exceeds said set discharge current.

10. The elevator control device according to claim 1, further comprising:

10 a sum current detection unit that detects a sum of an output current of said rectifier circuit and a discharge current from said charging/discharging circuit; and

a charging/discharging control unit in which, in addition to said set charging voltage, a set discharge current is set instead of said set discharge voltage,

wherein said charging/discharging control unit controls charging of said charging/discharging circuit such that a voltage generated on said DC capacitor detected by said capacitor voltage detection unit charges said electric double layer capacitor if said set charging voltage is exceeded and controls discharging of said charging/discharging circuit such that said electric double layer capacitor is discharged if said sum current detected by said sum current detection unit exceeds said set discharge current.



11. The elevator control device according to any of claim 8 to claim 10, further comprising:

a terminal voltage detection unit that detects a terminal voltage of said electric double layer capacitor;

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a charging/discharging control unit in which at least said set charging voltage and a fully charged set voltage of said electric double layer capacitor are set,

wherein said charging/discharging control unit controls  
10 charging of said charging/discharging circuit such that a voltage generated on the DC capacitor detected by said capacitor voltage detection unit charges said electric double layer capacitor if said set charging voltage is exceeded and stops charging if said terminal voltage of said  
15 electric double layer capacitor detected by said terminal voltage detection unit during charging control reaches said fully charged set voltage.

12. The elevator control device according to any of  
20 claim 8 to claim 10, further comprising:

a terminal voltage detection unit that detects a terminal voltage of said electric double layer capacitor;  
and

a charging/discharging control unit in which at least  
25 said set discharging voltage and a set voltage for voltage drop of said electric double layer capacitor are set,

wherein said charging/discharging control unit controls discharging of said charging/discharging circuit such that if a voltage generated on said DC capacitor detected by said capacitor voltage detection exceeds said set discharge  
5 voltage said electric double layer capacitor is discharged and stops discharging if said terminal voltage of said electric double layer capacitor detected by said terminal voltage detection unit during discharge control reaches said voltage for voltage drop.

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13. The elevator control device according to any of claim 8 to claim 10, further comprising:

a charging/discharging current detection unit that detects a charging/discharging current of said electric  
15 double layer capacitor; and

a charging/discharging control unit in which an current instruction value in respect of said electric double layer capacitor is set,

wherein said charging/discharging control unit controls  
20 charging/discharging of said charging/discharging circuit for charging/discharging of said electric double layer capacitor such that a charging/discharging current detected by said charging/discharging current detection unit coincides with a pre-set current instruction value.

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14. The elevator control device according to any of claim 8 to claim 10, further comprising:

a charging/discharging current detection unit that detects a charging/discharging current of said electric double layer capacitor; and

a charging/discharging control unit in which a charging/discharging limiting value of said electric double layer capacitor is set,

wherein said charging/discharging control unit controls said charging/discharging circuit such that said charging/discharging current is restricted if said charging/discharging current detected by said charging/discharging current detection unit exceeds said charging/discharging limiting value.

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15. The elevator control device according to any of claim 8 to claim 10, further comprising:

a fuse circuit connected in series with said electric double layer capacitor and that breaks a short-circuit current discharged from said electric double layer capacitor in an event of a short-circuit fault of a constituent element of said charging/discharging circuit.

16. The elevator control device according to any of claim 8 to claim 10, further comprising:

a fuse circuit connected in series with said  
charging/discharging circuit and that breaks a short-circuit  
current discharged from said electric double layer capacitor  
in an event of a short-circuit fault of a constituent  
5 element of said charging/discharging circuit.